

**Table X**  
**Corrosion Behavior of Materials in Ammonia\***

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- A.** Ammonia (Corrosion less than 0.005 inches per year at temperatures below that at which dissociation of ammonia and nitriding of metals occurs).\*\*
1. High-alloyed austenitic steels
  2. Cast silicon-iron (more than 14.5% Si.)
  3. Alloyed cast iron (2% Cr., 25-30% Cr., 14% Ni., 6% Cr., 5% Cu.)
  4. Nickel (liquid NH<sub>3</sub> to 250 C NH<sub>3</sub> gas)
  5. Nickel-Chromium alloys
  6. Monel
  7. Platinum, its alloys and less common metals
  8. Titanium
  9. Tantalum
  10. Concrete (Concrete must be well aged)
  11. Enamel
  12. Glass
  13. Graphite
  14. Porcelain
  15. Quartzware
  16. Stoneware
  17. Plastics
    - a. Haveg 41,60
    - b. Teflon
    - c. Hostaflor
    - d. Fluorthene
    - e. Polyethylene, 150 F
    - f. Sulfur cements, 200 F
    - g. Epoxy Resins, 150 F
  18. Rubber (natural up to 150 F)
  19. Aluminum (99.5%)
  20. Hastelloy, B, C, D
- B.** Ammonia (Corrosion rates not acceptable)
1. Nickel (500°C, NH<sub>3</sub> gas)
  2. Nickel-Copper Alloys
  3. Copper-base Alloys
  4. Plastics
    - a. Polyisobutylenes
    - b. Polyvinyl Chlorides
    - c. Styrene Copolymers, 200 F
  5. Wool
  6. Saran

**Table X**  
continued - **Corrosion Behavior of Materials in Ammonia\***

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**C. Aqueous Solutions of NH<sub>3</sub> (Corrosion rate 0.02 inches per year)**

1. 316 S.S.
2. Austenitic Steels
3. Silicon-iron (more than 14.5% Si.)
4. Alloyed cast iron
5. Nickel-Chromium alloys
6. Platinum, titanium
7. Tin
8. Enamel
9. Glass
10. Graphite
11. Porcelain, Quartzware
12. Polyisobutylenes
13. Havg 41, 60
14. Teflon
15. Hastaflor
16. Fluorthene
17. 20 C, 30% Pe-Ce fibre, Vinyon, Nylon, Perlon, Asbestos
18. Cast Iron
19. Lead
20. Aluminum
21. Hastelloy B, C, D
22. Polyethylene
23. Rubber (natural and synthetic)
24. Styrene Copolymers, 200 F
25. Zirconium

**D. Aqueous solutions (Corrosion rates not acceptable)**

1. Nickel
2. Monel
3. Tantalum
4. Silver
5. Wool
6. Saran
7. Copper
8. Bronze
9. Glass, 250 F
10. Brass
11. Steel, 300 C under pressure

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\*Recommend that each specific condition be checked for proper materials of construction.  
Corrosion Handbook, H. H. Uhlig, Editor, John Wiley and Sons, New York (1948).  
Chemical Engineer's Handbook, Perry.  
Corrosion Guide by Erich Rabola (1968).

\*\*Certain high tensile strength steels have developed Stress-corrosion cracking in ammonia service. However, such cracking can be avoided by the addition of 0.2 percent water to the ammonia as an inhibitor.

Stationary steel pressure vessels for ammonia service shall comply with part 1910. Section 1910.111, Title 29 of the Code of Federal Regulations (OSHA).

Steel pressure vessels employed for the transportation of ammonia in interstate commerce shall comply with specifications as are appropriate and as are contained in parts 171-179 of Title 49 of the Code of Federal Regulations.